



Moorgate

Calculation

Year 5

Help at Home

ADDITION

In Year 4, your child was introduced to column addition and this is extended to use larger numbers and decimals too.

Column addition

Add the units (ones) first, then the tens

A. Single 'carry' in units B. 'Carry' in units and tens

$$457 + 76$$

$$\begin{array}{r} 457 \\ +76 \\ \hline 13 \\ 120 \\ \hline 400 \\ 533 \end{array}$$

Then

$$538 + 286$$

$$\begin{array}{r} 538 \\ + 286 \\ \hline 14 \\ 110 \\ \hline 700 \\ 824 \end{array}$$

Once children are secure in this, they can use:

$$58 + 87$$

$$\begin{array}{r} 58 \\ + 87 \\ \hline 145 \\ 11 \end{array}$$

$$457 + 76$$

$$\begin{array}{r} 457 \\ + 76 \\ \hline 533 \\ 11 \end{array}$$

$$538 + 286$$

$$\begin{array}{r} 538 \\ + 286 \\ \hline 824 \\ 11 \end{array}$$

Use the words
'carry ten' and
'carry hundred',
not 'carry one'

Try and spend time with your child practising this as it will secure number facts

Once confident, use with larger whole numbers and decimals.

$$2467 + 785$$

$$\begin{array}{r} 2467 \\ + 785 \\ \hline 3252 \\ 111 \end{array}$$

$$4824 + 2369$$

$$\begin{array}{r} 4824 \\ + 2369 \\ \hline 7193 \\ 11 \end{array}$$

$$46.73 + 78.6$$

$$\begin{array}{r} 46.73 \\ + 78.60 \\ \hline 125.33 \\ 111 \end{array}$$

SUBTRACTION

During Year 5, your child is encouraged to make their own choices, and develop their knowledge of decomposition

Expanded method

Throughout Years 3 and 4, your child has used an **expanded method** split (partition) numbers into tens and units, and **exchange** tens for ones

$$83 - 38$$

$$\begin{array}{r} 80 \ 3 \\ - 30 \ 8 \\ \hline \end{array}$$

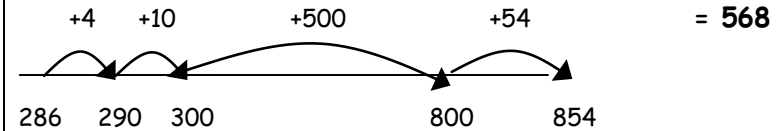
$$\begin{array}{r} 70 \ 13 \\ - 30 \ 8 \\ \hline \end{array}$$

$$\begin{array}{r} 70 \ 1 \\ - 30 \ 8 \\ \hline 40 \ 5 \end{array}$$

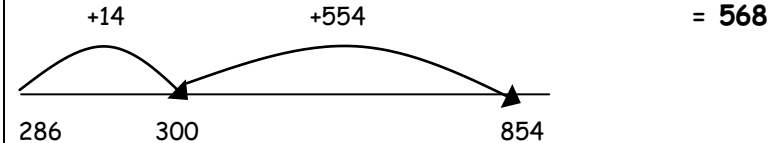
Exchange from hundreds to tens and tens to ones

Number line (counting up)

$$854 - 286$$



Or (the efficient method)



Expanded method

$$854 - 286$$

$$\begin{array}{r} 800 \ 50 \ 4 \\ - 200 \ 80 \ 6 \\ \hline \end{array}$$

$$\begin{array}{r} 700 \ 140 \ 1 \\ - 300 \ 80 \ 6 \\ \hline 500 \ 60 \ 8 \end{array}$$

Decomposition

$$854 - 286$$

$$\begin{array}{r} 7 \ 14 \ 1 \\ - 2 \ 8 \ 6 \\ \hline 5 \ 6 \ 8 \end{array}$$

SUBTRACTION continued...

These methods are also used for larger numbers and decimals:

Decomposition	Number line (count up)
$ \begin{array}{r} 8146 \\ - 4729 \\ \hline 3417 \end{array} $	$ \begin{array}{c} 8146 - 4729 \\ \hline \begin{array}{ccccccc} & +71 & +200 & +3000 & & +146 & \\ \curvearrowright & & \curvearrowright & & \curvearrowright & & \curvearrowright \\ 4729 & 4800 & 5000 & & 8000 & 8146 & \end{array} \end{array} $
$ \begin{array}{r} 83.6 \\ - 47.9 \\ \hline 35.7 \end{array} $	$ \begin{array}{c} 83.6 - 47.9 \\ \hline \begin{array}{ccccccc} & +2.1 & +30 & & +3.6 = 35.7 & & \\ \curvearrowright & & \curvearrowright & & \curvearrowright & & \curvearrowright \\ 47.9 & 50 & & & 80 & 83.6 & \end{array} \end{array} $

By the end of Year 5, most children prefer to use decomposition

MULTIPLICATION

Throughout Year 4 your child was shown how to use the Grid method, and introduced to Vertical multiplication. Please practise these with your child.

Grid method	Vertical multiplication
$ \begin{array}{r} 4 \times 67 \\ \hline \begin{array}{ c c } \hline 60 & 7 \\ \hline 240 & 28 \\ \hline \end{array} \end{array} $	$ \begin{array}{r} 4 \times 67 \\ \hline \begin{array}{r} 67 \\ \times 4 \\ \hline 28 \\ 240 \\ \hline 268 \end{array} \end{array} $
<p>It can be used for more complex calculations:</p>	<div style="border: 1px solid purple; border-radius: 15px; padding: 5px; display: inline-block; width: fit-content;">Place the 'carry' digit below the line</div>
$ \begin{array}{r} 7 \times 89 \\ \hline \begin{array}{ c c } \hline 80 & 9 \\ \hline 560 & 63 \\ \hline \end{array} \end{array} $	$ \begin{array}{r} 7 \times 89 \\ \hline \begin{array}{r} 89 \\ \times 7 \\ \hline 63 \\ 560 \\ \hline 623 \end{array} \end{array} $
$ \begin{array}{r} 4 \times 378 \\ \hline \begin{array}{ c c c } \hline 300 & 70 & 8 \\ \hline 1200 & 280 & 32 \\ \hline \end{array} \end{array} $	$ \begin{array}{r} 4 \times 378 \\ \hline \begin{array}{r} 378 \\ \times 4 \\ \hline 32 \\ 280 \\ 1200 \\ \hline 1512 \end{array} \end{array} $
<div style="border: 1px solid purple; border-radius: 15px; padding: 5px; display: inline-block;">It is important that the child chooses their method</div>	<p style="text-align: right;">= 1512</p>

Most children continue to use the Grid method through Year 5 and Year 6

MULTIPLICATION continued...

In Years 5 and 6, your child will be shown the grid method in a slightly different way. They should ONLY use the vertical multiplication if they are confident, and it helps them more

Grid method

It helps for your child to estimate the answer first, by rounding the numbers:

$$38 \times 57$$

38×57 is approximately $40 \times 60 = 2400$.

x	50	7
30	1500	210
8	400	56
	1900	266

Then, add these sums for the overall product

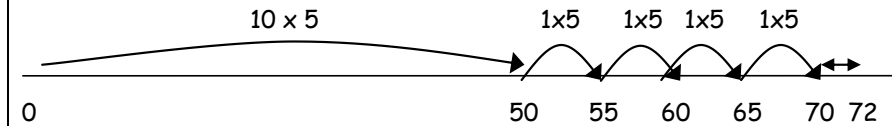
$$\begin{array}{r} 1900 \\ + 266 \\ \hline 2166 \\ 1 \end{array}$$

DIVISION

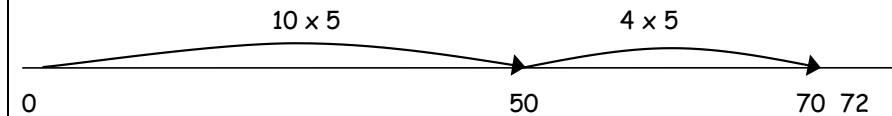
During Year 4, your child will have moved on from using a number line to start to use 'chunking' (short division).

Number line

$$72 \div 5 = 14 \text{ r } 2$$



Or a more efficient



Chunking

When chunking we repeatedly take away multiples or 'chunks' of the starting number.

$$51 \div 3 = 17$$

$$\begin{array}{r} 51 \\ -30 \\ \hline 21 \\ -21 \\ \hline 0 \end{array} \quad \begin{array}{l} 10 \times 3 \\ 7 \times 3 \\ \hline 17 \end{array} \rightarrow$$

$$87 \div 3 = 29$$

$$\begin{array}{r} 87 \\ -30 \\ \hline 57 \\ -30 \\ \hline 27 \\ -15 \\ \hline 12 \\ -12 \\ \hline 0 \end{array} \quad \begin{array}{l} 10 \times 3 \\ 10 \times 3 \\ 5 \times 3 \\ 4 \times 3 \\ \hline 29 \end{array}$$

OR

$$\begin{array}{r} 87 \\ -60 \\ \hline 27 \\ -27 \\ \hline 0 \end{array} \quad \begin{array}{l} 20 \times 3 \\ 9 \times 3 \\ \hline 29 \end{array}$$

DIVISION continued...

This then progresses to using hundreds and decimals.

Chunking

$$222 \div 6 = 37$$

$$\begin{array}{r}
 222 \\
 - \underline{60} \quad 10 \times 6 \\
 162 \\
 - \underline{60} \quad 10 \times 6 \\
 102 \\
 - \underline{60} \quad 10 \times 6 \\
 42 \\
 - \underline{30} \quad 5 \times 6 \\
 12 \\
 - \underline{12} \quad \underline{2} \times 6 \\
 \hline
 37
 \end{array}$$

These are inefficient. Try to find the largest possible chunks to shorten it!

$$\begin{array}{r}
 222 \\
 - \underline{180} \quad 30 \times 6 \\
 42 \\
 - \underline{42} \quad \underline{7} \times 6 \\
 \hline
 37
 \end{array}$$

Short multiplication methods are introduced to those secure with place value.

24×6 becomes $ \begin{array}{r} 24 \\ \times 6 \\ \hline 144 \\ \hline 2 \end{array} $ Answer: 144	342×7 becomes $ \begin{array}{r} 342 \\ \times 7 \\ \hline 2394 \\ \hline 21 \end{array} $ Answer: 2394	2741×6 becomes $ \begin{array}{r} 2741 \\ \times 6 \\ \hline 16446 \\ \hline 42 \end{array} $ Answer: 16 446
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Short division methods are introduced to those secure with place value.

$98 \div 7$ becomes $ \begin{array}{r} 14 \\ 7 \overline{) 98} \\ \underline{7} \\ 28 \\ \underline{28} \\ 0 \end{array} $ Answer: 14	$432 \div 5$ becomes $ \begin{array}{r} 86 \text{ r}2 \\ 5 \overline{) 432} \\ \underline{40} \\ 32 \\ \underline{30} \\ 2 \end{array} $ Answer: 86 remainder 2	$496 \div 11$ becomes $ \begin{array}{r} 45 \text{ r}1 \\ 11 \overline{) 496} \\ \underline{44} \\ 56 \\ \underline{55} \\ 1 \end{array} $ Answer: $45 \frac{1}{11}$
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The methods included in this booklet are taken from Moorgate Calculation Procedure.

Staff use these as guidance, so you will be supporting your child in the same ways.

All children learn at different paces. Some will be using strategies from lower in school, and others will progress to the next ones. This booklet is provided as a guide only, but if you would like a copy of the years below/ above your child's school year, please come and see your class teacher. They will be happy to discuss this with you.